19 today. Federal funds for ship time are dwindling as well. For the first time in 15 years, for example, microbiologist Julie Huber of the Marine Biological Laboratory in Woods Hole, Massachusetts, is relying entirely on private money for her studies. A slot on the *Falkor* in September will allow her to test a microbial sampler on the sea floor — technology development that she says would have progressed more slowly with incremental federal grants.

There is a long history of millionaires dabbling in oceanography without doing much publicly available science. Hollywood director James Cameron has a small group of researchers advising him on his deep-sea dives, such as his record-breaking trip last year to the Mariana Trench. He is donating the submersible used on that dive to the Woods Hole Oceanographic Institution (WHOI) in Massachusetts, although he is holding back the discoveries from that plunge for use in a feature film.

The Schmidt Ocean Institute, established in 2009, aims to reach a wider array of scientists. A parallel set-up, the Marine Science and Technology Foundation, also headed by Eric Schmidt, supports the development of oceanography tools, such as a video recorder for plankton and a surface-water analyser powered by wind and solar energy. "They are accelerating change in a field which was already changing gradually," says Kim Juniper, an oceanographer at the University of Victoria in Canada, who will lead a *Falkor* cruise around Vancouver Island in August to study waters with low oxygen levels.

The *Falkor* can also carry equipment from other organizations. In 2014, for instance, it will take the WHOI's deep-diving Nereus robot to the Mariana Trench.

Given the ship's Internet ties, it is no surprise that managers favour projects emphasizing open data. Charles Paull, a marine geologist at the Monterey Bay Aquarium Research Institute in Moss Landing, California, is leading the current cruise in the Gulf of Mexico, where his team is mapping an underwater limestone cliff that bears marks from the meteorite impact 65 million years ago that is thought to have killed the dinosaurs off. Paull plans to post his maps on Google Earth within two months — not the two years that most oceanographic data take to trickle out.

Data sharing is not a requirement for research proposals, says Victor Zykov, Schmidt Ocean's director of research, but those that include an open-data component are ranked higher than those of equal scientific value that do not.

Falkor cruises are scheduled after the proposals have been peer reviewed by independent scientists. For the round of cruises beginning in 2014, the 48 applications made were whittled down to seven projects. Sixty-one applications have arrived for the cruises beginning in 2015, with a final selection of seven or so expected late this summer, says Zykov. "It's hard to deny that interest is growing," he says. Wendy Schmidt adds that if the cruises turn out good science, the institute may consider adding a second ship in the future.

One catch is that although ship time is provided for free, researchers must find a way to fund their salaries and any post-cruise science. For some this isn't too much of a problem. Chris German at the WHOI, for instance, used leftover NASA money from an earlier cruise to pay for his portion of a *Falkor* trip this summer to the Caribbean, where he will use Nereus to hunt for new hydrothermal vents.

Just about the only other US ship allowed such unfettered exploration is the US National Oceanic and Atmospheric Administration's *Okeanos Explorer*, German says. But the *Falkor*, with fewer education and outreach obligations, can operate with more focus. "It's a new way of doing business," he says. "The model is theoretically good, but how it's going to work out remains to be seen." ■ SEE EDITORIAL P.410

PUBLISHING

Sham journals scam authors

Con artists are stealing the identities of real journals to cheat scientists out of publishing fees.

BY DECLAN BUTLER

Scientific publishing, meet cybercrime. Two reputable European science journals have fallen prey to identity theft by criminals who have created counterfeit journal websites. These online doppelgängers have duped hundreds of researchers into paying author fees, with the ill-won gains being funnelled to Armenia.

Editors of the victim journals first learned of the scam last year, but their attempts to put a stop to it have so far come to nothing. The crooked websites are masquerading as *Archives des Sciences*, a multidisciplinary journal founded in 1791 and published by the Society of Physics and Natural History of Geneva (SPHN) in Switzerland; and *Wulfenia*, a botany journal published by the Regional Museum of Carinthia in Klagenfurt, Austria.

The scammers attend to the closest of details, displaying on multiple websites not only the titles of the authentic journals, but also their impact factors, postal addresses and international standard serial numbers — the unique codes used to identify journals.

Editors of the authentic publications fear that the ruse has tainted the reputations of their journals.

"Victims are regularly contacting me to ask about the status of their papers: they transfer money and don't see their papers published," says Roland Eberwein, editor-in-chief of the authentic *Wulfenia* and head of the Botanic Center at the Carinthia museum, which includes a herbarium of more than 200,000 specimens.

"We are currently wasting our time trying to fight these people," says Robert Degli Agosti, editor-in-chief of *Archives des Sciences* and a plant biologist and electrophysiologist at the University of Geneva.

Neither of the authentic journals has its own dedicated website, making them easy prey for imposters. In response to the scam, however, the SPHN and the Carinthia museum have put warning notices on their home pages, and *Wulfenia* has started publishing its back issues online.

The forged sites look so convincing that they initially misled Thomson Reuters, a metrics company based in New York that produces the Scientific Citation Index and compiles journal impact factors.

But by May last year, the company had become suspicious, writing to the SPHN for an explanation of the "huge discrepancy" between the content of articles in print issues of *Archives des Sciences* — which Thomson Reuters indexes — and on the website. It noted, too, a discrepancy in publishing frequency: "We receive and index 2 issues of each volume for each year, while the website is now listing 12 issues per volume, one each month," it wrote to the society.

One of the imposters had even persuaded Thomson Reuters to include a link to the false journal in its list of indexed publications; the company moved swiftly to ▶

remove the link when the scam was uncovered. The action triggered "a barrage of complaints and requests to reactivate the link from representatives of the false journal", says Marie McVeigh, director of content selection at Thomson Reuters. She says that the company has also received enquiries from customers "asking why the articles that had been accepted by one of the false journals were not appearing in our indexes".

"The quality and integrity of our content is of the greatest importance to us," adds McVeigh.

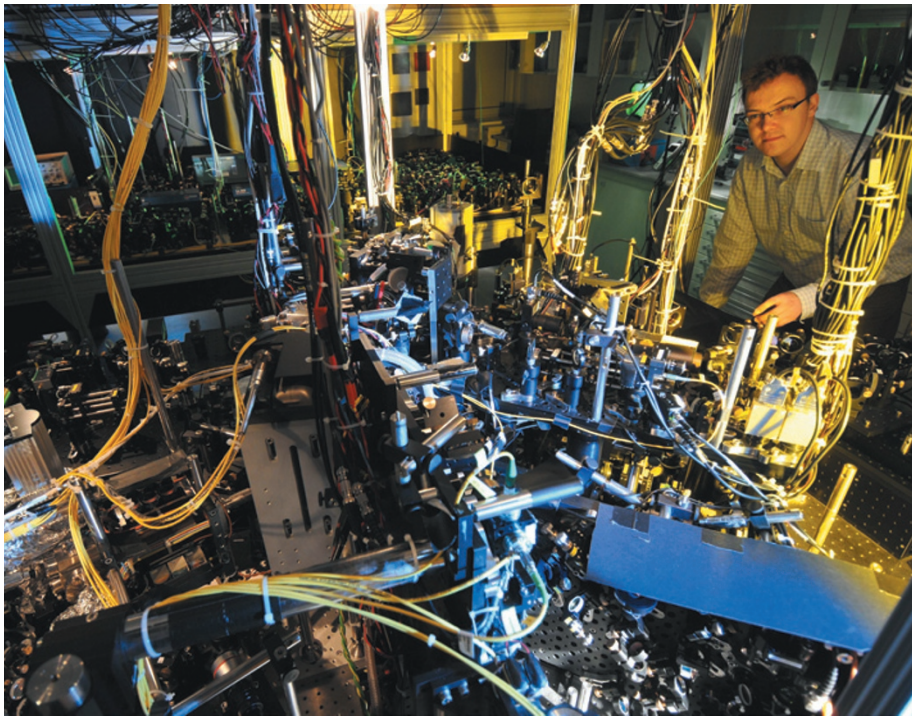
In a further impudent touch, the various counterfeit *Archives des Sciences* websites list an editorial board with 87 members, including Daniel Gamelin, a chemist and materials scientist at the University of Washington in Seattle, and Gerald Cleaver, a high-energy physicist at Baylor University in Waco, Texas. Both are perplexed — and annoyed. "This is the first I have heard of this website or of my listing; I have no affiliation with this organization, nor have I ever," says Gamelin. Cleaver, too, says that his name is being used without his permission.

The 'editor-in-chief' of the fake *Archives des Sciences* journal is named on the counterfeit websites as "Prof. Dr. Eliana Schmid", with the affiliation "Geneva, Switzerland". The counterfeit *Wulfenia* sites give as the editor-in-chief Vienna S. Franz and list 35 editorial-board members, with most affiliations giving only city and country. Eberwein and Degli Agosti think that these named editors-in-chief are fictional.

Researchers who have submitted to the fake journals pay dearly. Both the counterfeit *Archives des Sciences* and the fake *Wulfenia* charge author fees of more than $500, with instructions to address payment to accounts at two banks in Yerevan, Armenia.

Degli Agosti has reported the counterfeit *Archives des Sciences* websites to the Cybercrime Coordination Unit Switzerland, but was told that the sites were hosted in the United States, so the unit could not act directly against them. However, it advised him that he could press criminal charges under Swiss cybercrime laws. The University of Geneva's lawyers are helping the SPHN to draft its case, but the society is not part of the university, so it will have to take its case forward alone.

Austrian police have made little progress on the *Wulfenia* case, says Eberwein: they closed down a fake site hosted in Austria, but multiple replicas popped up on servers in other countries. Austrian authorities have told Eberwein that the scope for legal redress is limited, but, unconvinced, he has contacted *Archives des Sciences* to swap notes. ■ SEE NEWS FEATURE P.433



THORSTEN NAESER, MAX PLANCK INSTITUTE FOR QUANTUM OPTICS

Physicists have found Higgs-like particles in a superfluid at the Max Planck Institute in Munich, Germany.

PHYSICS

Higgs physics on the cheap

Tabletop Higgs particles may illuminate cosmic cousin.

BY EUGENIE SAMUEL REICH

More than three decades ago, before the world's most powerful particle collider was even on the drawing board, two physicists discovered a Higgs boson. On a tabletop.

In 1981, Peter Littlewood and Chandra Varma, two solid-state theorists at Bell Laboratories in Murray Hill, New Jersey, realized that a mysterious effect seen in a niobium selenide superconductor could be explained by the jiggling of the invisible field that causes electrons in the material to pair up and move as one without resistance. Mathematically, the disturbance in the field looked very like one that is associated with the Higgs particle found by particle physicists.

Because the superconducting field was already known, the search for the associated particle never drew as much attention as the hunt by particle physicists for the Higgs. That quest culminated on 13 March at the Large Hadron Collider (LHC) at CERN, Europe's main particle-physics facility near Geneva in Switzerland, with the announcement of a definitive Higgs detection: the first direct evidence of a Higgs field permeating the Universe and giving objects mass.

But physicists agree that the superconducting Higgs is closely related to its particle-physics cousin. Both arise from the vibration of an invisible field that forces ordinary particles to oscillate in sync. Now physicists are seeing signs that other condensed-matter systems can generate Higgs-like particles, raising hopes that work on one Higgs, studied cheaply on tabletops, can inform the study of another, probed by a US$5-billion collider. "I'm hoping there will be cross-fertilization," says Varma, now at the University of California, Riverside, who spoke in a packed session on solid-state Higgs particles at a meeting of the American Physical Society (APS) in Baltimore, Maryland, on 19 March.

It wouldn't be the first time that particle physics stood on the shoulder of condensed-matter physics. When Peter

NATURE.COM
For CERN's discovery of the Higgs, see:
go.nature.com/gmp3ef